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## SCIENTIFIC BOOKS.

*Topographic Surveying*, Including Geographic, Exploratory and Military Mapping. By HERBERT M. WILSON, U. S. Geological Survey. New York, John Wiley & Sons. 1900. 205 Figures.

It is always a source of great satisfaction in picking up a book to know that the author by training and experience is qualified to speak with authority on the subject therein discussed. In the case of the book under review we have as its writer a graduate of one of our best schools of engineering, who afterwards served an apprenticeship under Mr. Henry Gannett, the master topographer, and then, after spending considerable time abroad, became one of the Division Chiefs of the Geological Survey.

Every feature of topographic work is taken up, treated exhaustively, and with the aid of illustrations and tables left in the shape deemed the most serviceable to the student. The descriptions of instruments and their adjustments are scattered through the book and the tables are inserted at the point where reference to them is first made. This is not the usual practice, and its practicability is a question of personal preference. Ordinarily we look in the back of the book for all tables and expect to find the first pages devoted to the description of instruments.

An important topic, seldom referred to, that is found in this treatise is the way in which to equip a party for field work, including the supplies needed, medicines that should be provided, and also suggestions as to how to look after the details of camp life. In this connection it might be suggested that space is given to some matters of trifling importance. However, the severest criticism that suggests itself is the frequent comparison of the work of the U. S. Coast and Geodetic Survey with that of the Geological Survey. This contrasting places the relative accuracy and cost in a misleading light and should not be so presented by an official of either organization. Then, too, the most expensive work of the Coast Survey has been to a great extent experimental, and many organizations have profited by the lessons thus learned—none more so than itself.

As, for example, the work of Professor Woodward, which resulted in perfecting the tape-line base-measuring system whereby it was possible for a single party in the Coast Survey to measure nine bases in a single season. A wrong impression is given in comparing cost and accuracy, except when great emphasis is put on the fact that the cost increases rapidly with the accuracy—apparently out of reasonable proportion. If we say that one party can execute a primary triangulation at a cost of 90 cts. a square mile with a probable error of one-tenth of a foot for each side of this square while another charges \$30 for a square mile and secures a probable error of three-hundredths of a foot, it looks as though we were paying more than thirty times as much to secure a probable error one-fourth as great. A still greater cause for comment is the statement that while both organizations demand the same degree of precision in precise leveling, one costs \$10 a mile, while the other costs only \$5.

It is far from the purpose of this review to question the accuracy of these statements, but the opinion is held that such comparisons create wrong impressions and react upon the author. It is believed that the author is in error when he says that in the topographic survey of the District of Columbia no system of bench marks was left in the course of the leveling, also that the St. Albans base was measured with the secondary apparatus, and that any form of tape-stretcher is more quickly manipulated than that used by the Coast Survey. The reason for referring to the matters just mentioned is that in the eyes of many they mar a book otherwise most excellent, and in the main practically beyond improvement.

It is safe to say that there is not a book on topography in the English language, or perhaps in any other language, that gives with such clearness and discrimination the amount of detail required for maps intended for various purposes, and the simplest and quickest methods for securing the necessary data. For this reason it is believed that it is eminently fitted for use as a text-book—a rare quality in technical treatises—as well as for a handbook for those actively engaged in topographic work.

The sketches, diagrams and maps are taken from work actually done, thereby establishing confidence in the processes described. In this connection it might be suggested that a word of caution should be uttered regarding the tendency to give the interval of contours that have been *sketched*. Beyond this one point, a careful reading has not disclosed anything but meritorious features in all that pertains to the technical side of the book.

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*Neudrucke von Schriften und Karten über Meteorologie und Erdmagnetismus herausgegeben von PROFESSOR DR. G. HELLMANN. No. 13, Meteorologische Beobachtungen vom XIV. bis XVII. Jahrhundert. Berlin, A. Asher & Co. 1901. 4vo. Pp. 70 introduction and notes + pp. 130, fac-similes. Price, 18 Marks.*

This is the latest of these reprints that have been reviewed from time to time in SCIENCE, and its object is to elucidate the beginning of meteorological observations and to eradicate the impression, which is common even among specialists, that with very few exceptions there were no continuous observations before the end of the 17th century. It is here shown that already at the close of the 15th century many series of observations existed, including some simultaneous ones, and it seems probable that regular observations of the weather were made even in very ancient times. The present volume deals with two kinds of records, meteorological observations on land—those without instruments from 1337 to 1645, and those with instruments from 1649 to 1700—and observations made at sea between 1492 and 1700.

The earliest journal of the weather extant is that kept by William Merle at Driby, in Lincolnshire, England, between the years 1337 and 1344. The Latin MS. was reproduced in fac-simile, with a translation, about ten years ago by the late Mr. Symons, but, as the edition was limited and hardly went outside of England, Dr. Hellmann has thought it worth while to reprint a portion. The next oldest record (1439) is also English, and then come German, Austrian, Italian, Swiss, Belgian, Spanish and Danish observations. It is certainly not known generally that observations in Brazil preceded

those in this country, and that the first weather observations in North America were by a Swede, Johann Campanius, on the Delaware River, near Philadelphia, during 1644 and 1645, a summary of the weather for each month being given. The first observations with instruments were readings of the barometer each day during the years 1649, 1650 and 1651 in Clermont (Auvergne) and at the same time at Paris and at Stockholm. Of these only M. Périer's observations in Clermont have been preserved and they are reproduced. The original log-book of Christopher Columbus's first voyage (1492-93) no longer exists, but an extract relating to the change of weather on this side of the Canary Islands, and an account of a West India cyclone encountered on the return voyage, and which is the first description of such a storm, are quoted. There are nine other extracts from logs of early voyages, making, with the observations on land, 36 rare journals. Even if known to students, hitherto these have been practically inaccessible, but now they are presented as nearly as possible in the original form and enriched with copious notes by the best authority on the subject. These reprints have not been put on sale in America, but one or two copies of the current volume may be had at the publisher's price, viz., \$4.50, from the Blue Hill Observatory, Hyde Park, Mass.

A. LAWRENCE ROTCH.

*Die Pflanzen-Alkaloide. Von JUL. WILH. BRÜHL, Professor an der Universität Heidelberg; in Gemeinschaft mit Edward Hjelt und Ossian Aschen Professoren an der Universität Helsingfors. Mit Eingedruckten Abbildungen. Braunschweig, F. Vieweg und Sohn. 1900. Mk. 14.00.*

The discovery of plant alkaloids belongs to the early part of the nineteenth century, and their subsequent study and investigation rank among the important achievements of modern chemistry. In 1803, Derosne, a French apothecary, obtained impure morphine from opium. In 1805, Sertürner, a German apothecary, isolated the pure alkaloid and, in 1817, recognized its basic character and showed it to be the active principle of opium. Since that time the study of alkaloidal chemistry has been steadily pro-